JPRS 82451

13 December 1982

West Europe Report

SCIENCE AND TECHNOLOGY

No. 130

FBIS FOREIGN BROADCAST INFORMATION SERVICE

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WEST EUROPE REPORT

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CONTENTS

ELECTRONICS

THOMSON STOPS PRODUCTION OF IC MANUFACTURING EQUIPMENT

Paris L'USINE NOUVELLE in French 21 Oct 82 p 83

[Article by Jean-Luc Austin]

[Text] No integrated circuits without wafer steppers or electronic maskers. Cameca, a Thomson subsidiary, had succeeded in overcoming the American quasi-monopoly on these machines. Its decision to stop their production is thus even more surprising.

The fabrication of integrated circuits requires know-how, but also specialized machines, particularly wafer steppers and electronic maskers. Within the Thomson group, Cameca, subsidiary of the "communications" branch, had been charged with the development of these machines so as to gain freedom from the American quasi-monopoly in this area.

Today, however, Thomson wants to discontinue this activity; an announcement is even supposed to have been made to the personnel involved (about 500 people). This decision is the more surprising since two prototype machines perfected by Cameca are ready for delivery: an electronic masker for Leti (Electronics and Data Processing Laboratory), and a wafer stepper for DCI, the Thomson division which manufactures integrated circuits.

Although Thomson does not intend to explain the reasons for its decision, the creation of a joint subsidiary plant of Matra and the American company GCA (2500 employees, 281 million dollars in 1981) to manufacture this type of machines, does not appear to be unrelated.

European Market Too Restricted for Two Large Producers

A second explanation for Thomson's decision is that there is no room on the European market for two large manufacturers. And Matra is aiming very high: its plant in Nantes will employ nearly 1000 people in 1985. This will be the fourth settlement in Nantes, of the group led by Jean-Luc Lagardere, after MHS, LTI Stratifies, and Euromask.

The third reason is Thomson's difficulty in financing the industrialization of these machines. While an industrial electronic masker is not very different from a prototype model, the same is not true for a wafer stepper, which is used intensively in production. The industrialization cost for Cameca's machines would come to nearly 250 million francs over a five year period. However, this investment is still conceivable beyond the imperatives of technologic independence, since Cameca hoped to control 10 percent of the world market for these machines in 1985, estimated at some 800 million dollars.

Cameca had even bet on market growth by developing an X-ray wafer stepper with a performance ten times that of the current models. This technologic advance had even been blessed by the government last May, when it considered that Matra should perfect the current machines and Cameca those of the next generation. And although DIELI (Directorate of Electronics and Data Processing Industry) at the Ministry of Research and Industry, today declares that this sector of activity should be developed, in particular for electronic maskers, Thomson has rejected this "national division of labor."

An unplanned but saddening consequence of these maneouvers is that French integrated circuits will henceforth be manufactured on American technology machines.

11,023
CSO: 3698/50

ERICSSON TO REORIENT EFFORTS TOWARD DATA PROCESSING

Paris ELECTRONIQUE ACTUALITES in French 22 Oct 82 p 9

[Article by Ph. Marel]

[Text] In announcing during a press conference held in Paris on 14 October, that the data processing subsidiary of the Ericsson group, Ericsson Information System (EIS), was on its way toward financial equilibrium this year, its president, Mr Ledin, provided some details about the reorientation of the group from telephones to data processing.

In recent years, Ericsson has had to face a crisis in its telephone activities (new deals on its captive markets, increasingly stiff competition on open markets, and necessary reconversion of electromechanical products to electronic systems).

This crisis has resulted in a reduction of 20,000 people in production personnel, bringing the number of employees at Ericsson this year to 70,000 (for a turnover of 17 billion francs).

Another consequence of this crisis has been the need to reorient the group's activities toward other sectors, among which data processing. The creation of ESI, a subsidiary specialized in data processing, is the essential part of this reorientation strategy.

ESI, whose turnover should reach 3.5 billion francs this year, and whose accounts are expected to be balanced, will eventually provide the largest portion of the Ericsson business.

Created last January from a merger of Ericsson's computer peripherals activity and the activities (minicomputers, terminals) of the Datasaab company, acquired in April 1981, ESI should find itself expanded by the Facit company, specialized in office equipment, which is being bought from Electrolux.

ESI will thus have extensive capabilities in a field which is destined to undergo the highest growth between now and the end of the decade: office automation. With the combined know-how of these companies, Ericsson expects to soon offer systems for integrated text and data processing.

It is possible to ask whether this strategy oriented toward office automation, has not been selected a little too late. The market appears to be very competitive, especially against such manufacturers as IBM, DEC, and Wang, who have been sharpening their weapons for several years. Added to this is Ericsson's hesitation to adopt the local network option, which at present is a handicap since this technique rests at the foundation of the development of office automation.

Bright Future in France

In any case, the French market nevertheless illustrates an aggressive attitude on the part of the group.

Ericsson, whose telephone activities were taken over by Thomson nearly five years ago, returned strongly to this market only after buying Datasaab.

The goals of Ericsson France were outlined by Mr Lacombe, its chief executive.

The company expects to double its turnover, from 50 MF in 1982, to 100 MF in 1983. This figure should reach 240 MF in 1985, and the number of employees (100 at present) should grow similarly.

Lastly, the French subsidiary of the group will reach its profitability threshold after having crossed the 150 MF turnover point, that is, in 1984. The essential commercial business of EIS France will be based on the distribution of the IBM-compatible Alfaskop terminals, which the company plans to sell primarily in the private sector.

11,023
CSO: 3698/53

MICROLITHOGRAPHY TECHNIQUES SPOTLIGHTED AT CONFERENCE

Paris ELECTRONIQUE ACTUALITES in French 15 Oct 82 pp 1, 18

[Article by F. Grosvalet]

[Text] The eighth international colloquium on microlithography, Microcircuit Engineering 82, held in Grenoble last week, attracted an exceptional number of participants. 370 people from 14 countries attended this conference, with three large foreign delegations representing the United States, Great Britain, and the Netherlands.

The French delegation of 200 people revealed the interest that our country has in micrographic techniques. This was also made evident last year during the first national colloquium on dry etching (see ELECTRONIQUE ACTUALITES of 4 December 1981).

The 82 version of the Microcircuit Engineering colloquium, which has been held in Europe once a year starting in 1975, was followed with close attention by a very "studious" audience. There were five original presentations given on the fields of lithography by ion beams (including a presentation of the first structures developed by this technique) and by x-rays, and on resins-sensitive layers.

In addition, the organizers of the colloquium (SEE [Electronic and Electrotechnical Society], GIEL [expansion unknown], and SITELESC [Electronic Tubes and Semiconductors Industries Union]) emphasized "the essential and strategic role" of microlithographic materials, whose worldwide market in 1985 was $380 million, a figure which should double by 1985. Although it is hard to draw any definitive conclusions from this colloquium (and it was not intended that any such conclusions should be reached, as this conference is intended to present new developments and disseminate information), we can nonetheless discern a general trend toward an "association" of all the procedures. The semi-conductor

industry which now uses all the lithographic techniques available on the market, should continue to do so (as they all have their own advantages and disadvantages) and will adopt new techniques as they show what they can do.

Optics Remains Highly Competitive

For this reason, optical lithography, far from being displaced, remains highly competitive, particularly through the results obtained in the field of deep UV [ultraviolet]. Electronic masking is beginning to work well; its major drawback is still its cost. The two techniques of the future--lithography by x-rays and by ion beams--are moving ahead slowly but surely. For x-ray lithography, there is now the expectation of a no longer very distant appearance of "cheap" sources (resulting from the use by a French laboratory of a mini synchro-cyclotron). The ion beam technique, which has the same disadvantage of cost as electronic masking, does appear to have potentially greater performances than the electronic masking technique, because it offers the possibility of wider combinations.

In related fields--resins-sensitive layers, etching and inspection--there have also been some developments, but nothing very revolutionary is happening now. In the field of resins, though, specialists are now looking forward to the arrival of the first resins for deep UV. This should help to maintain the competitive position of optical lithography.

The Grenoble conference was organized in eight sessions: five on lithography, one on inspection, one on etching, and the final session on resins. There was also a round table session on radiation sources for microlithography.

Outside of the five lectures mentioned earlier, there were no truly exceptional presentations except for those on the brilliant results and high-quality work done primarily by the Japanese.

First Structures Developed by Ion Beams

Four invited papers (a report on the status of microlithography, inspection techniques by electron beams, modern etching techniques in microlithography, and resins in microlithography) provided information on the current state of the art, but did not provide any startling new information.

As we mentioned earlier, the session on optical lithography reported on some important work done in the field of deep UV

with presentations by IBM (rapid high-resolution lithography in deep UV using "excimeres" lasers); by Thomson-CSF/SML (the "exiplex" KrF laser as a future source in deep UV for optical projection); and by the Gas and Plasma Physics Laboratory of the University of Paris XI (device for the reproduction of masks in the V-UV [violet-ultraviolet] domain).

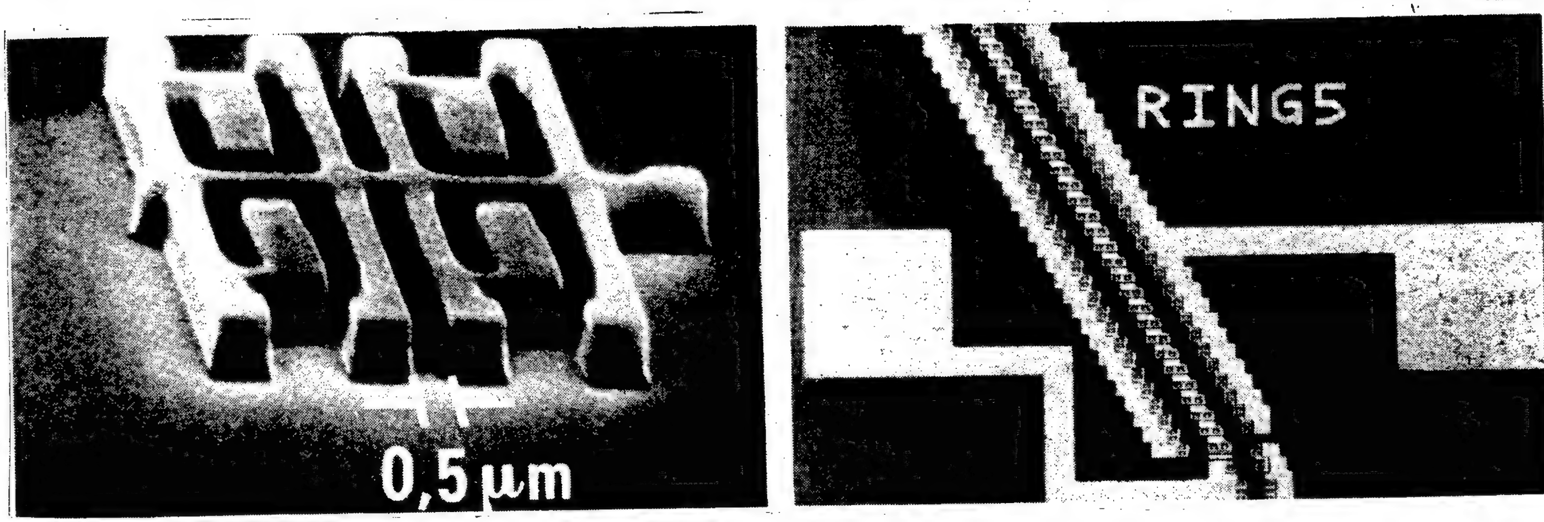
The session on electronic masking included a presentation by GCA [expansion unknown] of its rapid variable-spot system for direct tracing, the EB-7000.

For etching, despite the notable improvements made, much still remains to be done. It is becoming more and more apparent that practice is essential, both in the use of this procedure, and in terms of its inclusion among lithography techniques.

In the field of inspection, the users are beginning to be aware of the problem and are trying to solve it; so there might well be a revolution in this area one day.

In the field of ion-beam lithography, we were able to attend the Cambridge University (Great Britain) presentation on the first submicronic structures developed by means of this technique. To the best of our knowledge, this was a "first" anywhere in the world. The result is of particular importance as it has already been followed by some unofficial industrial applications.

There were new developments reported with x-rays, with the presentation of models which can be used to develop more economical sources. These included the model of the CEN [Nuclear Research Center] at Saclay and of the CENG/LETI [Nuclear Research Center/Electronics and Data Processing Technology Laboratory, Grenoble] (a mini electron storage ring), along with the LURE of the University of Paris XI (a ring with permanent magnets). The last two original presentations covered the joint work done by the University of Ottawa in Canada and of IBM's lab in San Jose, California. These presentations were given in the session on resins. They covered the development of resins for distant UV by a chemical amplification mechanism and the use of this mechanism for the development of polymers which can be used as resins in lithography.



The eighth international colloquium on microlithography, which was just held in Grenoble, gave some idea of the amount of progress still possible in the field of integrated circuits. The above photos show two highly advanced structures developed by Siemens: to the left is a photosensitive lacquer etching; to the right is an MOS ring oscillator with 57 stages, in 0.5 µm technology (its propagation time does not exceed 100 ps).

7679
CSO: 3698/40

BRIEFS

THIN DISPLAY SCREEN--Goteborg--A thin, lightweight and energy-saving screen which does not cause physical complaints such as tired eyes and headaches is being developed at Chalmers. Two researchers in the Physics Department, Torbjorn Lagerwall and Bengt Stobler, are working with a data screen built around a new type of liquid crystals. These are faster than those used for example in the displays of modern minicalculators (LCD--Liquid Crystal Display). The screens made today utilize ordinary television technology. This has the result that more than half of those who now use screens regularly are affected by various complaints. Liquid crystals are actually organic fluids, the molecular orientation of which can be altered by means of electric fields, so that they either allow light to go through or shut it out. On the new screens the text becomes sharp and completely free from flicker. Further, it can be made dark on a light background, and it becomes sharper the brighter the room is, just as ordinary text on paper. /Text/ /Stockholm SVENSKA DAGBLADET in Swedish 27 Oct 82 p 7/
11949

3698

SWEDISH TESTS SHOW WAVE ENERGY PRODUCTION ECONOMICAL

Stockholm SVENSKA DAGBLADET in Swedish 22 Oct 82 p 6

[Article by Margareta Artsman]

> [Text] Wave energy has now become a more interesting energy alternative than ever. Tests conducted in Lake Lyngnern and outside Vinga for a number of years have confirmed that energy can be produced at a cost of 20 ore per kilowatt, which is a couple of ore less than energy produced from nuclear power plants now under construction.

This is according to the shipyard Svenska Varv and the consulting firm Technocean, which presented their findings at an energy conference in Goteborg last Thursday.

As an alternative to shipbuilding, Svenska Varv has seriously begun to focus on wave energy based on studies conducted by Chalmers under the leadership of Professor Curt Falkemo.

They now want to establish a wave-energy test site on Gotland, preferably on the east side of the island. Both municipal and rural councils on Gotland are supporting the project.

Patented

For confidential reasons, Svenska Varv does not want to give out too much information about the study. The key element in their wave energy production is a hose pump--the patented discovery of Jan Persson and Per Fredrik Troften. It is now being tested on a larger scale at a test station outside Vinga.

The wave-energy plant consists of a large number of buoys with the patented hose pump under each. The movement of the waves stretches the hose pumping water to the turbine, which in turn drives the generator.

The energy is conveyed to land by a 400-meter long cable. The size of the Vinga test station now in use is 30 kilowatts, sufficient to supply energy for five electrically heated homes.

"However, we are not testing output, but rather how well the construction can withstand the wind and the weather at Vinga," said Thomas Rindby with Technocean.

"Weather, among other things, is the reason for wanting to establish larger facilities on Gotland. We hope to do that by 1984-85," said Lennart Claesson, also with Technocean. "We aim to make use of existing harbor facilities and plants and to lay a 4 to 5-kilometer long cable, which will extend into suitable water.

Svenska Varv wants to find out if present calculations will hold up under large-scale tests. They feel that Gotland will be an important demonstration site. The cost of establishing a plant on Gotland with an output of 1 megawatt should be about 8 to 15 million kronor.

Hope for Money

The hope for money lies with the Energy Production Research Committee.

"The government made a mistake in cutting grants to wave energy research," said Lennart Claesson.

"That only means we might lose what has already been invested. It is important to continue the basic research so that we can move forward with out work."

The reason Gotland is more interesting than the west coast with respect to establishing a prototype plant is that fishing will not be affected as much there, weather conditions are better and that ice hardly ever forms southeast of the island.

8952
CSO: 3698/43

KUKA INDUSTRIAL ROBOTS COMPETE WELL IN WORLD MARKET

Hamburg DER SPIEGEL in German 25 Oct 82, pp 118, 120, 123

[Article: "It Is Beginning to Rattle"]

[Text] A medium-Size enterprise in Augsburg is one of the most important German robot producers.

The former warehouse way back in the corner of the industrial site of Friedberg near Augsburg does not look much like the factory of the future.

Heavy cast-iron pieces are scattered on the concrete floor. On wodden tables fitters are carefully putting together the heavy parts. Of all the tools that are being used, the most progressive one seems to be the monkey wrench.

It is almost unbelievable that the products of this well-established trade can be found by the hundreds on the most modern assembly lines of the European aotomobile industry: In the final assembly hall of the Kuka firm, approximately 60 workers are putting together up to 30 industrial robots every month. The automatic tools are welding the bodies of BMW and Daimler-Benz, of Ford, Peugot, Alfa Romeo and British Leyland.

The successful product of the firm is a large orange monster of approximately 2 meters. It resembles an antiaircraft gun rather than the machines used in the film "Star War." As far as the history of the development of robots is concerned, the "Kuka IR 601/60" will probably be remembered as a rather crude but vigorous ancestor.

At any rate, with its iron arm extended, the IR 601/60 can lift 60 kilograms. Its joints, each driven by an electric motor, can turn on six different rotational axes. It lends an amazing dexterity to the 2.2-ton gun: It moves its iron fist, called a lantern, at a speed of 1 to 2 meters per second.

Because of a computer-control system which switches motors on and off intelligently the IR 601/60 can reach any given point between the floor and a height of 3 meters and at the same time totate almost a complete circle.

According to the prospectus, the Kuka robot is condemned to operate with "practically no free play"; it follows its preprogramed course with constant precision: The deviation is guaranteed to be no more than 1.2 millimeters.

Because of these characteristics, the Augsburg automat captured a leading position among the German avant-garde robots. About 20 percent of approximately 2,300 industrial robots in the FRG originate with the Keller and Knappich firm, which calls itself Kuka.

Thus, following the Volkswagen Works--which maintains a market share of 25 percent--Kuka is the biggest German robot manufacturer.

But Volkswagen does not count as a competitor. To date all attempts of marketing VW robots outside its own firm have met with little success. The major customers of the robot industry are automobile manufacturers and they are simultaneously also VE's competitors. They are not very willing to give VW a detailed insight into their planning--something that is necessary for the installation of robot assembly lines for new models. Consequently Wolfsburg builds its machine monsters only for its own consumption.

As a result the Augsburg enterprise has to deal primarily with foreign competition. The leaders on the world market are Unimation, a U.S. company, and Asea, a Swedish enterprise; they are getting as many robot orders from FRG companies as Kuka does.

The Augsburg company reached its top position among German robot manufacturers by producing machinery that can perform precise work even when the load is heavy. Particularly in spot welding, the joining of body parts in the automobile industry, the welding instrument must be applied precisely at the same locations.

At first even Unimation's robots were not up to this task. The enterprise, which had been established by the inventor Joseph F. Engelberger (share of world market: 40 percent), offered the first robots for industrial production toward the end of the 1950's.

In 1970, when Daimler-Benz wanted to use robots for the first time for one of its welding lines, the instruments that had been selected almost collapsed. Kuka, theGerman company which represented Unimation at that time, rebuilt the American robots so they could do heavy work.

"It was the hour of birth of our own robot development," Stefan Mueller, product manager for Kuka's industrial robots remembers.

It was a difficult birth. The first mechanical robot madein Augsburg--it was called "Famulus"--was simply "not marketable" (Mueller). Due to a fundamental construction defect, "Famulus" suffered from a "nodding effect": The arm of the robot consistently tilted from its projected position.

For a while the robot development at the Kuka plant progressed only slowly, because it had little money of its own for research.

Kuka is part of the Industrial Works Karlsruhe Augsburg Corporation (IWKA), which is showing losses for most of its operations. The mixed concern of the industrialist family Quandt combines under one roof a strange conglomeration from steel bottles to antitank mines. Garbage trucks, for instance, also operate under the name of Kuka, and the firm supplies the turret for the Marder, an armored tank.

Burkhard Wollschlaeger, the member of the IWKA executive board responsible for the Kuka Welding Equipment and Robot Company--which in the meantime has become an independent legal entity--did not promote the development of robots until 1978. Since 1980 the sale of robots has doubled every year; now it amounts to approximately DM 70 million.

Nevertheless, little money is to be made from the sale of these robots that cost between DM 250,000 and DM 350,000. This year, however, Mueller, the manager of the robot division, hopes for a "small profit." Kuka and the other robot manufacturers still have to invest large sums of money in new technology.

To date robots have presented little competition to the worker but to those machines which for a long time have produced the most important sales for the Wlding Equipment Company: Industrial robots are replacing automatic transfer lines in the automobile industry.

To date the welding of bodies on conveyor belts along assembly lines has been done by "numberically"--using perforated taptes--controlled machines. This equipment, however, can only be converted at great expense, for instance, when new models of automobiles are to be manufactured.

Robots are much more flexible: At the touch of a few keys on the computer keyboard a completely new procedure can be programmed. A robot welding line can even process different body models in a random arrangement. A sensor tells the robot what task needs to be performed at a particular moment.

The know-how of transfer line technology gave Kuka an advantage over many other robot manufacturers who do not know their way around the automobile industry that well.

Good relations with automobile producers continued to help sales. The biggest Kuka customer is BMW, where 200 robots are employed. Like Kuka, a majority interest in the Bavarian Motor Works belongs to the Quandt family. Eberhard von Kuenheim, the head of BMW, is the chairman of the board of directors of IWKA.

There are also close ties to Daimler-Benz. The Kuka garbage truck bodies, for instance, are attached to Mercedes truck chassis.

By the mid-1980's, however, all European automobile manufacturers will have completely outfitted their welding lines with robots. To date approximately 90 percent of Kuka's robot sales have been destined for this market which will then be saturated.

Robot producers like Kuka are therefore looking for new areas of use for their iron colleagues.

In the German branch of Unimation in Heusenstamm near Frankfurt, for instance, robots are being trained for new tasks in the food industry. Unimate robots are practicing by restacking Langnese frozen foods on pallets and putting chocolates into boxes. "Many things are beginning to happen," Norbert Schlimm, Unimation's business manager, says with delight.

This second wave of robots, for which manufacturers are preparing right now, will for the first time replace jobs to a noticeable extent. In the past packing jobs, which are to be taken over ny robots, required a lot of muscle and to date there has been little automation in this field.

Schlimm of Unimation figured out that as many as 50,000 people in the food industry are loading pallets. His inadequate consolation: "We are endangering Turkish guest workers."

Within a few years, robots will also be able to do more complicated assembly-line work in the automobile industry. By that time sensors will be ready for production that can control the claws of the robots.

Hans Jaeger of the Metalworkers Union, a labor union expert on automation, figures that approximately 1.1 million workers are involved in assembly-line tasks.

According to his estimates, between 200,000 and 300,000 workers could be replaced by industrial robots by the end of this century. By then at least 40,000 robots, the labor union leader states, will be in operation in German factories.

Robots manufacturers are more cautious with their predictions (between 10,000 and 15,000 industrial robots by 1990): Too optimistic predictions of growth might only increase the fear of the iron colleagues. But Kuka Chief Wollschlaeger is also counting on continuing "growth rates in 2-digit figures" for the robot market.

Nevertheless, it will be difficult for Kuka to maintain its share of the market. To date Augsburg's offer has been too limited, concentrating on heavy robot models for welding automobile bodies.

Market leader Unimation, on the other hand, is offering quite a selection--including robot dwarves that are no taller than desk lamps and which can be used, for instance, for tedious jobs in the electronics industry.

The Augsburg company barely meets the latest standards in computer control. The German Electro-Multi Siemens is supplying computers including software at proud prices.

The expensive control system is contributing to the fact that Kuka robots are among the most costly robots in the industry. Other major producers, on the other hand, developed their control systems--the brain of the robot--under their own management.

Compared to the big competitors on the world market, Kuka seems almost like a high-quality workshop with its crew of approximately 200 people who are working in Augsburg for the robot division.

Unimation and Kawasaki, its Japanese licensed partner, are producing around 200 robots per month--"as many as Kuka does in a year," according to a proud remark by Unimation Manager Schlimm.

8991
CSO: 3698/46

MACHINE TOOL INDUSTRY REGROUPS AROUND 'MFL'

Paris L'USINE NOUVELLE in French 7 Oct 82 p 82

[Article by Georges Le Gall]

[Text] Two new French machine tool companies were just created a few days ago: BS [Berthiez-Saint Etienne] and FL [Forest-Line]. These are two subsidiaries of the MFL [French Heavy Machines] holding company established on 3 September to bring together the activities of the former Berthiez (a SNECMA [National Aircraft Engine Study and Manufacturing Company] subsidiary) companies, St Etienne Machine Tool (which had been turned over by Ernault-Somua to the Line group), TMI [expansion unknown] (formerly Forest, which had been transferred to the control of IDI [expansion unknown], and Line.

BS will specialize in large lathes and FL in large milling machinery. Each company has a capital of 100 million francs, taken from the capital of the MFL holding company, which was 250 million francs.

Before the end of the year MFL, whose president is Louis Tardy and whose chairman of the board of directors is Pierre Lacour, will establish a technical and commercial structure on the east coast of the United States.

This move across the Atlantic is part of MFL's development program. The development contract signed between MFL and the ministry of research and industry calls for MFL (whose planned sales for 1983 are 590 million francs) to account for 6 percent of the worldwide production of heavy machine tools in 1986, up from 4 percent at present. This will be accomplished by investments of 200 million francs between 1983 and 1985.

In terms of personnel, contrary to what has been reported (see L'USINE NOUVELLE, weekly edition of 9 September 1982 page 57),

the staff of the four companies brought together into MFL will not be cut to 675 employees. In reality, the starting staffing level, which was 1,990 people, will be reduced by attrition, by such measures as early retirements and job reclassification: from 675, it will be brought to 1,315 people (675 at BS and 640 at FL).

Some hiring of specialized personnel is planned (in the fields of numerical control, industrial automation and data processing). About 20 people will be hired in 1983, and about 100 over the next 3 years.

7679
CSO: 3698/40

SCIENCE POLICY

MINISTER OUTLINES SWEDEN'S RESEARCH ORIENTATIONS

Stockholm DAGENS NYHETER in Swedish 8 Nov 82 p 14

/Text/ A new Government Research Advisory Board will be created in the government office building to advise the government on scientific issues.

This is what Minister Ingvar Carlsson, deputy prime minister, told TT /Tidningarnas Telegrambyra/. The mandate of the old Research Advisory Board, created by Tage Erlander 20 years ago, has expired.

"I want a Research Advisory Board which plays the role it had during Erlander's time," says Ingvar Carlsson, who is immediately responsible for the research. "We are now thinking of how to construct the new one. It is clear that it will mainly consist of researchers, but other persons as well can be included."

The new Research Advisory Board is an element in the efforts to activate Swedish research and development:

"My impression is that the old Research Advisory Board got off to a good start, but that the activity gradually acquired less practical importance. If you are to have a Research Advisory Board it must be full of initiatives and vital, otherwise it is of no use and can even do damage."

"We have indicated some areas of research which we believe are at the forefront," Ingvar Carlsson continues: "biotechnology, data technology, electronics and material technology, in which we believe Sweden could be among the foremost nations in the world."

"But in a democracy such as ours we should also have a broad base in social scientific and humanistic research, because it has a value of its own and because it is to form a foundation for more technically oriented research."

"Does Sweden today have a sufficient capacity of researchers or should it be expanded?"

"We have sufficiently many researchers, but not enough who earn degrees. We actually run a certain risk of having problems over the long run in filling the professorships in certain sectors. This is why we must see to it that in certain sectors there will be enough students choosing to go on to Ph D's."

"Do you want a greater exchange of international researchers?"

"Yes, I think that is exremely important. To be sure, Swedish research is at a high level, but we are a small country and consequently should be greatly interested in an exchange of research activity with other nations."

11949
CSO: 3698/57

FRG TO CONTINUE RESEARCH POLICY UNCHANGED, SAYS NEW MINISTER

Bonn RHEINISCHER MERKUR/CHRIST UND WELT in German 15 Oct 82 p 14

[Text] When the new Minister for Research and Technology Heinz Riesenhuber discussed the guidelines of his policy at a press conferencein Bonn a few days 4go some of the correspondents wondered whether the 46 year old bearer of a degree in chemistry was really a member of the CDU. The minister's formulation of the elements of his program could also have come from one of his Social Democratic predecessors. Riesenhuber's efforts to continue the former research policy, at least in its main features (together with the State Secretary Hans-Hilger Haunschild whom the new minister asked to stay in office), were unmistakable--he expressly emphasized that new courses of action should only be undertaken very cautiously.

The question about his membership in the CDU was, of course, asked purely rhetorically--Riesenhuber has been a member of this party since as long ago as 1961. He carries his membership for public display purposes so to speak, as if it were a correctly tied bowtie. When he was nominated as a candidate in the Bundestag elections of 1976, in fact, several CDU municipal districts also voted on whether Riesenhuber should be allowed to continue to wear this extravagant item of clothing. Permission was granted.

Heinz Riesenhuber, then district chairman of the Frankfurt CDU, member of the CDU presidium for Hesse and also technical manager of an artificial fibre company, succeeded in making the jump to the Bundestag. He became a member of the Committee for Research and Technology, headed the National CDU Committee of Experts for Energy and Environment and was already a sensation with his first speeches in the Parliament. His political opposite number at the time, Volker Hauff, research minister of the social-liberal coalition government from 1978 to 1980, soon recognized in Riesenhuber "the most important head in the opposition" as far as researcy and technology were concerned and called him a "computer brain."

Apparently the recognizition is based on mutual feelings since it is clear from the first statements of the new research minister that he intends above all else to continue Hauff's policies. For exaample, Minister Riesenhuber expressed support for a resumption of the dialogue on the opportunities and risks of new technologies which the last SPD research minister, Andreas von Buelow, considered of little effect, whereas Hauff regarded such talks and the evaluation of the technological consequnces as important.

Riesenhuber is of the opinion that the basic environmental requirements of a new technology should not be grafted on after the fact but should accompany the development of the technology itself and, in fact, in such a way that the technology and the establishment of the basic requirements be achieved simultaneously. Only under these conditions might one be able to expect that new technologies in an age of reason could be carried through publicly with reasonable, general acceptance.

Minister Riesenhuber sees basic research as one of the most important and central tasks of his regime. Basic knowledge gathered from basic research must, however, be made more rapidly available for practical application--a task which he would like to shift more strongly to the large research facilities (in doing so he is also thinking about having such centers and the private sector take up such projects jointly).

In view of the shortage of funds, however, Minister Riesenhuber also feels under an obligation to establish whether the large number of requested projects is "necessary and in fact rationally manageable." The goal of research should not be the completion of programs but rather the discover of key areas in which innovation and growth a0e possible and worth pursuing. At the same time one should always have in mind which delivery methods--direct or indirect--should be used in each case.

In contrast to his more skeptical predecessor, Riesenhuber would like to see the construction of both advanced atomic reactors, the fast-breeding reactor and the high-temperature reactor, carried to conclusion. The gaps in financing--in the billions--should not, to be sure, be closed either from the budget for research or from the general budget; here industry would have to make its contribution. He believes the conditions for greater commitment by industry in this area are especially favorable at this time: At the end of the month the studies on both reactors will be available, all important permits for component facilities are ready and the Parliamentary restriction against starting up the fast breeder will probably be gotten out of the way after the pro-breeder vote of the commission of inquiry in the near future.

So that he might be spared a disaster such as his predecessor had to endure with these two reactors, Minister Riesenhuber also inends to conduct a critical examination of nuclear waste disposal soon. This problem must be settled urgently and he is fearful that in this sector as well not all elements are assured as far as time and cost plans are concerned. Thus yet another study is being ordered. Thereby another characteristic of the new minister is noted: Even he has no intention of giving up studies and the reports of experts.

Hence even in this regard continuity in the administration of this ministry remains clear.

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BETTER LAB-TO-INDUSTRY TECHNOLOGY TRANSFER DISCUSSED IN BONN

Bonn RHEINISCHER MERKUR/CHRIST UND WELT in German 22 Oct 82 p 16

/Article by Michael Globig/

[Text] Engineers, politicians and manufacturers met in Bonn to discuss how cooperation between research and medium-size industry can be improved in the future

The accepted view that technical progress comes exclusively from large firms with corresponding research laboratories can no longer be justified. Rather, there is support for the conclusion that small and medium-size firms are superior to the large companies when it comes to contributions to technical progress. This was the conclusion reached by Richard Greiling, an industrial policy expert from Nuremberg in his dissertation entitled "The Contribution of Small and Medium-Size Companies to Technical Progress," which was recently published as volume 86 of Schriften zur Mittelstandsforschung (Reports on Mid-Level Research) by the Otto Schwartz Verlag, Goettingen.

Greiling substantiates his theses with examples of how mid-level companies "were successful with ideas" (the title of a series in the Frankfurter Allgemeine Zeitung, to which reference is made by the author). The spectrum ranges from Falk Verlag, Hamburg, with its specially folded city maps to the Werkzeugfabrik Rothenberger, Kelkheim (which expands the ends of pipes with an expanding pliers so that they can be joined to other pipes without an intermediate segment), and from the Otto Brentzel Company, Fischbach (which manufactures plastic-coated and corrosion-resistant concrete studs for highway construction), to Imchemie in Wermelskirchen, which presses acrylic resins into stone material for preservation.

Where does the impetus for technological progress come from in the small and mid-size companies that usually do not have their own research departments? One source is the twelve major research institutes in the Federal Republic. Here, in their work on basic

research or project-specific tasks, scientists repeatedly encounter usable processes and developments that might be of interest for industry. An accounting of the technology transfers from research institutes is of course meager, as was apparent in a symposium on this topic held last week in Bonn.

Although every major research center does have its own employee responsible for technology transfer, there are still many problems connected with contact with the mid-level firms, despite this sign of good will. Qual. Eng. Scheller, Kleindienst Machine Construction, Augsburg, mentioned a number of the difficulties: In the research centers, work is directed toward an area of specialization, but companies must be market oriented. Researchers develop their apparatus for laboratory experiments while companies must constitute them in such a manner that they are suitable for assembly-line production, for marketing and subsequently for scrapping. Scientists think about publication and about their own image, while manufacturers must think of sales and survival.

In view of these differing points of departure, if we then consider that researchers and manufacturers often speak two totally different languages, we can conceive how difficult cooperation can be, even when an idea has found its way to a company from a major research institute.

Scheller, who occasionally visits research centers and acquires in situ information on new processes and products, described an example of successful cooperation. His company, which makes machinery for laundries and car wash stations, was looking for a process to handle waste water so that it could be used again and not contribute to environmental pollution. He encountered a suitable technique at the GKSS Research Center, Geesthacht, which was used there for water purification in membrane set-ups to prevent these from being overgrown with algae. Working with the laboratory model, four engineers, two from the Geesthacht Research Center and two from the Augsburg manufacturer, developed an apparatus that can recycle up to four cubic meters of water per hour, which is the right size for car wash plants.

These new facilities were exhibited at last year's Hanover Fair, and the first licenses were granted. The machinery is currently being manufactured and the engineers are now experimenting with equipment that would handle the waste water from laundries, breweries, tanneries and dye plants, which is more difficult to process. The project is being supervised by former GKSS associate who switched to the Augsburg company, which is benefitting from his know-how.

In Bonn, Professor Schmidt-Tiedemann, managing director of the Phillips Research Laboratory in Hamburg, stressed that personnel transfers of this kind are especially suitable for conveying expe-

rience from research center to industry. However, such employment changes are not particularly popular in Germany as many scientists and engineers remain glued to their jobs because of an exaggerated desire for security. The electronic manufacturer Philips therefore practices employment alternation within the company -- with the added benefit of being able to utilize the advantages of personnel transfer, i.e. the liberation of creative abilities, without any social risk for those involved.

Professor Schmidt-Tiedemann suggested closer cooperation between both employers in order to make future employment change more acceptable. For example, employers might give joint consideration to the additional training required by an individual who intends to make a change and to how his new place of work should be set up.

However, it is not only the predisposition to mobility which is lacking in Germany, there is also very little inclination to take risks. In this country, researchers have not established around major research centers or universities the small and medium-size companies that are a natural accompaniment to laboratories or institutes in the United States. The medium-size microelectronic plants in the "Silicon Valley" of California (the area having been named for the basic material of all semi-conductor construction components), near Stanford University, is an example of this, as is the new genetic engineering firms being established on the east coast of the US.

On the other hand, to mention an example cited by Heinz Riesenhuber, the Federal Minister for Research, no genetic engineering companies have been established to date in the area near the Braunschweig Association for Biotechnology. And the situation is quite similar in areas surrounding other major research centers. For example, the Juelich Nuclear Research Institute can point to only one new company that has been established at its front door: A former KFA associate set up Reaktorwartungsdienst und Apparatebau GmbH /Reactor Maintenance Service and Apparatus Construction GmbH/, which manufactures apparatus for low-temperature and nuclear technology. Since this 30-man company is familiar with all of Juelich's requirements for special vacuum containers used in research and since it is also almost the only company that is in a position to fulfill these requirements, it is often awarded contracts.

Rolf Teenhaus, a board member of the Juelich Nuclear Research Institute, emphasized that, since the potential for centers is greater and since it ranges from measurement technology to electronics, medical technology and material research, and to new soldering techniques and genetic engineering, small and medium-size companies could do very well with an occasional glance at

the work of major research centers. Another speaker at the Bonn symposium indicated that, instead of waiting for visitors, the large research centers should open their doors more frequently to mid-level companies, and invite them to meetings and inspection tours.

Federal Research Minister Riesenhuber has asked the twelve major research institutes in the Federal Republic to devote greater attention in the future to economic conversion of the results of their scientific work. To promote this conversion process, he announced in Bonn that a 30,000 DM prize had been established for peak performances in technology transfer. This move shows that the Minister is serious about his request to unearth technological know-how buried in the major research centers and make better use of it.

Perhaps he might also consider in conjunction with Federal Finance Minister Stoltenberg how researchers could be encouraged to take risks and how scientists could be spurred to establish their own companies. Financial aid for starting companies, the awarding of public grants to newly established firms and lowered taxes for companies that for a limited period would enter a partnership for joint development of a project were some of the suggestions offered by participants at the Bonn Symposium

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